

DOCUMENT RESUME

ED 465 183

CS 511 192

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TITLE A Framework for Early Literacy Instruction: Aligning Standards to Developmental Accomplishments and Student Behaviors. Pre-K through Kindergarten. Revised Edition.

INSTITUTION Mid-Continent Research for Education and Learning, Aurora, CO.

SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.

PUB DATE 2000-00-00

NOTE 36p.; For the first edition, see ED 446 141.

CONTRACT RJ96006101

AVAILABLE FROM Mid-Continent Research for Education and Learning, 2550 S. Parker Rd., Ste. 500, Aurora, CO 80014-1678. Tel: 303-337-0990. For full text: <http://www.mcrel.org/products/standards/framework.pdf>.

PUB TYPE Legal/Legislative/Regulatory Materials (090)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS *Academic Standards; Behavior Patterns; *Benchmarking; Child Development; Definitions; Early Childhood Education; *Emergent Literacy; Models; *National Standards; *State Standards; Student Behavior; *Student Evaluation

ABSTRACT

The purpose of this document is to provide more detailed guidance around early literacy instruction than afforded by currently available national and state standards documents. In particular, this document: (1) establishes consistent definitions for the terms "standard" and "benchmark"; (2) establishes a consistent format for early literacy standards and benchmarks; (3) articulates a set of early literacy standards and benchmarks that are based on current national and state standards documents and that reflect the foundational knowledge and developmental differences representative of the research on early literacy development at the pre-k and kindergarten levels; and (4) provides sufficient and appropriate information aligned with this set of standards and benchmarks to aid pre-k and kindergarten teachers in assessing the early literacy development of their students and making classroom instructional decisions. This publication is divided into two sections. Section 1 includes a discussion of critical issues related to current national and state standards documents and a description of the process that was followed to develop the early literacy standards and benchmarks that are a focus of this publication. Section 2 includes the early literacy standards and benchmarks, along with additional information and guidance to help classroom teachers implement these standards and benchmarks in the classroom in a developmentally appropriate manner. Appendixes contain a list of 85 items of research and theory reviewed on early childhood development; an 18-item list of national and state standards documents reviewed; and a list of definitions of terms. (RS)

A Framework for Early Literacy Instruction

Aligning Standards to Developmental Accomplishments and Student Behaviors

Revised Edition

Pre-K Through Kindergarten

Elena Bodrova
Deborah J. Leong
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Acknowledgments

The authors would like to acknowledge Dr. M. Susan Burns, George Mason University; Dr. Peg Griffin, Alabama State University; Dr. Oralie McAfee, Professor Emeritus, Metropolitan State College of Denver; and Chris Snyder, Mid-continent Research for Education and Learning, all of whom provided expert assistance in reviewing the standards and benchmarks in this document. Grateful appreciation also is extended to Jan Yoder, Mississippi Bend Area Education Agency, Bettendorf, Iowa, and Frank Fielden, Colorado State Department of Education, for their field-testing efforts. In addition, thanks go to Dawn McGill, Mid-continent Research for Education and Learning, for graphic design, and to Barbara Gaddy, Mid-continent Research for Education and Learning, for her editing assistance.

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This publication is based on work sponsored wholly, or in part, by the Office of Educational Research and Improvement (OERI), U.S. Department of Education, under Contract Number #RJ96006101. The content of this publication does not necessarily reflect the views of OERI, the Department, or any other agency of the U.S. government.

Table of Contents

SECTION 1: INTRODUCTION	1
Background	1
National and State Standards Documents: Critical Issues	2
The Process of Developing Early Literacy Standards and Benchmarks	3
Review of Current Research and Theory on Early Literacy Development	3
Review of Current National and State Standards Documents	4
Establishing Consistency in Definition and Format	4
Identification of Major Categories Related to Early Literacy Development	4
Articulation of Early Literacy Standards and Benchmarks	4
Development of Additional Information for Classroom Implementation	5
SECTION II: EARLY LITERACY STANDARDS AND BENCHMARKS	7
Summary of Standards and Benchmarks	7
Reading - Standard 1	9
Benchmark 1.1	9
Benchmark 1.2	10
Benchmark 1.3	12
Benchmark 1.4	14
Benchmark 1.5	16
Writing - Standard 2	19
Benchmark 2.1	19
Benchmark 2.2	20
Benchmark 2.3	22
Appendix A: Research and Theory Reviewed on Early Childhood Development	25
Appendix B: National and State Standards Documents Reviewed	30
Appendix C: Definitions of Terms	32

I. Introduction

The purpose of this document is to provide more detailed guidance around early literacy instruction than afforded by currently available national and state standards documents. In particular, this document

1. establishes consistent definitions for the terms *standard* and *benchmark*;
2. establishes a consistent format for early literacy standards and benchmarks;
3. articulates a set of early literacy standards and benchmarks that are based on current national and state standards documents and that reflect the foundational knowledge and developmental differences representative of the research on early literacy development at the pre-k and kindergarten levels; and
4. provides sufficient and appropriate information aligned with this set of standards and benchmarks to aid pre-k and kindergarten teachers in assessing the early literacy development of their students and making classroom instructional decisions.

This publication is divided into two sections. Section 1 includes a discussion of critical issues related to current national and state standards documents and a description of the process we followed to develop the early literacy standards and benchmarks that are a focus of this publication. Section 2 includes the early literacy standards and benchmarks, along with additional information and guidance to help classroom teachers implement these standards and benchmarks in the classroom in a developmentally appropriate manner.

In connection with this work, McREL also offers workshops in the development and use of these early literacy standards and benchmarks in pre-k and kindergarten classrooms (<http://www.mcrel.org/resources/literacy/ela/training.asp>), as well as an early literacy diagnostic assessment linked to the standards, called the *Early Literacy Advisor* (<http://www.mcrel.org/resources/literacy/ela/aboutela.asp>).

Background

In recent years, many major studies (e.g., National Reading Panel, 2000; Snow, Burns, & Griffin, 1998) have found that the seeds of literacy are planted before children begin formal instruction in reading and writing. There is now empirical evidence that differences in pre-literacy experiences are associated with varied levels of reading achievement. For example, research shows that many children who begin school with fewer experiences in and less knowledge about literacy are unable to acquire the prerequisites quickly enough to keep up with formal reading instruction in first grade (see Snow et al., 1998, for a recent review). In addition, recent studies of kindergartners (West, Denton, & Germino-Hausken, 2000) have found that only 37 percent of children entering kindergarten have a basic familiarity with print.

As empirical evidence has grown about the effects of pre-literacy experiences on subsequent academic achievement, so has research on what content knowledge is most appropriate for young children. Nationally recognized experts have identified general milestones, or accomplishments, of early literacy development in recent reports sponsored by the National Academy of Sciences (Snow et al., 1998), the National Reading Panel (2000), and by the International Reading Association and the National Association for the Education of Young

Children (IRA & NAEYC, 1998). These general accomplishments are formulated in terms of age-appropriate expectations, for example "kindergarten-aged children develop basic concepts of print and begin to engage in and experiment with reading and writing" (IRA & NAEYC, 1998, p. 40). These expectations can serve as guidelines for "identifying challenging, but achievable goals or benchmarks for children's literacy learning" (p. 39).

More recently, there have been calls to develop pre-k and kindergarten content standards and benchmarks by a diverse group of educators concerned with the education of young children. For example, the National Research Council's recent report (Bowman, Donovan, & Burns, 2000) on early childhood pedagogy recommends the development of content standards for early literacy, including standards that identify pre-literacy knowledge and skills. At the federal level, this trend can be seen in recent revisions to the Head Start Act of 1981 (Head Start Act, 1998) that include a number of literacy performance measures not previously specified for children at this age. To date, 49 of the 50 states have adopted state-level standards that include standards for the kindergarten level (Kendall & Marzano, 1997).

National and State Standards Documents: Critical Issues

The standards movement has focused educators on instructional practices that most effectively help students learn the content identified in state and district curriculum frameworks. However, as these frameworks have been implemented, several-critical issues have emerged.

In many of the national and state standards documents, standards are specified using a continuum of statements that represent various grade-level bands (often referred to as *benchmarks* or *indicators*). Although this delineation has provided some degree of clarity about the knowledge and skills students need to master, the scope and sequence of what children must learn has been incomplete. Further, the underlying foundational skills essential for early literacy development have not typically been identified. Existing benchmarks usually represent the knowledge and skills students ideally should master by the end of the highest grade level within a particular grade band. Specifically, for the K-4 grade span, benchmarks in existing national and state standards documents identify the knowledge and skills students should master by the end of 4th grade. Due to the summative nature of these benchmarks, pre-k and kindergarten teachers often have been left to identify the knowledge and skills their students should learn in order to meet the benchmarks at the end of the grade span.

As a result of this lack of direction, some educators have begun to create inappropriate and arbitrary expectations for young children. In some cases grade-level benchmarks have been created that are unrealistic, developmentally inappropriate, or both, resulting in "hurrying" or "accelerating" children through early literacy development without giving them sufficient time and instruction to master underlying cognitive concepts and skills. For example, although literacy acquisition constitutes a continuum with more advanced skills and concepts building on a foundation of more basic competencies, there are qualitative differences between how young children develop their early understandings and how older children learn more advanced content. Benchmarks at the early grade levels have lacked the specificity needed to clarify these qualitative differences.

Existing standards documents have been fraught with other problems, making it difficult for educators to effectively use them. First, many standards documents reflect *activities* students should

be involved in rather than the *knowledge* they should be learning, resulting in benchmarks that are vague and open to much interpretation. For example, a benchmark that requires students to "experience literature through read-alouds" is a statement of an *activity* students should engage in. This kind of statement does not directly articulate the knowledge or skills students are expected to learn as a result of engaging in read-aloud experiences, leaving teachers to infer what students must learn. Second, definitions of a *standard* differ from one standards document to another. Third, the distinction between statements that identify the knowledge students should be learning (*content standards*) and statements that describe students' expected level of performance of that knowledge (*performance standards*) has been unclear. Compounding the problem, many standards documents mix content standards with performance standards. The resulting lack of clarity has caused confusion and frustration as teachers have tried to align curricula and instructional practices to standards and benchmarks.

As educators continued to implement standards and benchmarks, an expectation emerged that evidence of student learning would be collected through various assessment practices. In addition to the assessment challenges faced by teachers at all grade levels (Shepard, 2000) early childhood teachers have other problems. For example, young children cannot be tested using the same kinds of tests used with older children. Young children must be assessed in a context that is inherently meaningful to them and similar to the context in which they are likely to apply the knowledge and skills that are the focus of the assessment. For example, children's reading abilities are better assessed using an illustrated storybook with bright, colorful drawings than a paragraph in test booklet with no accompanying pictures. Furthermore, young children typically have not developed "test-taking" skills. That is, in general they cannot sit still and attend for long periods of time in a group, blacken test bubbles accurately, or switch from one set of directions to another. Thus, observations, evaluations of individual students' work products, and other classroom-embedded assessment strategies are critically important.

The Process of Developing Early Literacy Standards and Benchmarks

There is a pressing need to provide pre-k and kindergarten teachers with a research-based set of early literacy standards and benchmarks along with the information and direction they need to monitor the early literacy development of their students. The following section describes the process we followed to develop standards, benchmarks, and supporting information that reflect research and theory about early literacy development at the pre-k and kindergarten levels.

Review of Current Research and Theory on Early Literacy Development

A review of current research and theory on the developmental patterns in the early literacy development of young children (see Appendix A) was completed. From this review, three major areas in which development must occur prior to the start of formal literacy instruction were identified: (1) knowledge and skills that are precursors to reading; (2) knowledge and skills that are precursors to writing; and (3) foundational cognitive and linguistic skills. Although it is possible to specify knowledge and skills that are primarily specific to early reading or writing development, it is much harder to specify general cognitive and linguistic skills since they affect far more than just literacy development. For this reason, only those standards and benchmarks that identify knowledge or skills that are precursors to reading and writing have been included in this document.

Review of Current National and State Standards Documents

A review of the standards identified in current national and state documents that relate to reading and writing development (see Appendix B) was completed. These documents were selected because they contain detailed descriptions of benchmarks at the pre-K and kindergarten levels.

Establishing Consistency in Definition and Format

Throughout the national and state standards documents, the terms *standard* and *benchmark* are defined in a variety of ways. For the purpose of this document, a *standard* is defined as a general statement that represents the information, skills, or both, that students should understand or be able to do. Standards typically identify the knowledge students should master by the end of their K-12 school experience; therefore, they are broad yet measurable statements.

A *benchmark* is a subcomponent of a standard. Specifically, it is a statement that reflects expected understanding or skill at a specific developmental level. In other words, a benchmark translates the standard into what the student should understand or be able to do at a specified developmental level. Benchmarks are much more specific than standards and provide more detailed information relative to a specific grade or course. Pre-k and kindergarten benchmarks would therefore translate the standards into statements that would be appropriate for students at these grade levels.

The early literacy standards and benchmarks identified in this document reflect these definitions. Their format is consistent with these definitions; both the standards and benchmarks are written as statements of information and skills rather than activities or tasks. Mastery of the benchmark is assumed; thus, there are no benchmarks that start with statements such as "begins to" or "makes an effort to."

Identification of Major Categories Related to Early Literacy Development

The major categories for the precursors to reading and writing benchmarks were identified as a result of reviewing the developmental patterns identified in current research and theory (See Exhibit 1). These categories not only help give definition to the standards but also provide a structure for organizing the benchmarks using terms and phrases common to pre-K and kindergarten teachers. Appendix C contains definitions of key terms used throughout this document, including some of the terms used in Exhibit 1 and terms used in Section II of this document.

Articulation of Early Literacy Standards and Benchmarks

After reviewing the research base and a representative sample of national and state standards documents, two early literacy standards were constructed — one for reading and one for writing:

Reading - Standard 1: Demonstrates competence in the general skills and strategies of the reading process.

Writing - Standard 2: Demonstrates competence in the general skills and strategies of the writing process.

Exhibit 1

Categories for Early Literacy Benchmarks

Reading and Writing Categories	
Alphabetic Principle	Phonological Awareness
Concepts of Print	Purpose of Writing
Conventions of Reading	Sight Word Recognition and Decoding
Conventions of Writing	Sound-to-Symbol Correspondence
Letter Formation	Text Comprehension
Oral Language Development	Visual Letter Recognition
Orthographic Knowledge	

A set of benchmarks for pre-k through kindergarten was then articulated for each of these standards. As previously noted, many of the benchmarks in the state and national documents cover a span of grade levels. Since these benchmarks typically identify expectations only for the highest level in each grade span (e.g., grade 4 for K-4 benchmarks), there is a need to identify the concepts and skills for the earlier grades in each span (e.g., grades K, 1, 2, and 3). Early literacy benchmarks need to be clear, concise, and developmentally appropriate — not just “dumbed-down” versions of higher grade benchmarks. They must also reflect lessons learned from previous standards work and from current research and theory on early literacy learning and development.

The standards and benchmarks identified in this document are divided into “reading” and “writing” skills and strategies to help the reader connect early literacy developments with later expectations specified in reading and writing standards for grades K-12. However, literacy in early childhood is even more integrated than it is for older children; consequently, the skills and knowledge listed under “writing” will support reading development as well.

Early literacy research clearly shows that early literacy development takes place during a time that a child is undergoing rapid changes and developments in many areas. Many of a child’s growing skills and abilities develop in concert and support one another, while others seem to be relatively independent. Further, individual variations in development may be more pronounced at this young age. For example, while young children commonly develop reading competencies through their writing, children whose fine motor skills are not sufficiently developed may learn to read in another way. *Thus, the benchmarks in this document are not listed in any specific order, in terms of importance or development.*

Development of Additional Information for Classroom Implementation

Although standards and benchmarks provide teachers with substantially more information about what students should be learning, additional information is necessary for classroom implementation. If students are expected to master the knowledge addressed by a particular benchmark, they must be taught underlying conceptual understandings and skills — *supporting knowledge* — that lead to that mastery. In gathering evidence of student performance on a particular benchmark, teachers need to observe how students are performing on this supporting knowledge. This evidence could direct teachers to areas where students might need additional support in learning the benchmark.

Articulating benchmarks without identifying information related to the implementation and observation of these benchmarks forces teachers to search out this information for themselves. To help pre-k and kindergarten teachers implement the standards and benchmarks in this document, examples of the supporting knowledge that children need to learn for each benchmark have been included. Because this supporting knowledge contributes to the child's attainment of a standard or benchmark, teachers should consider this information as they design curricula and assessments.

In addition to identifying the underlying knowledge that children must acquire related to each benchmark, this document includes descriptions of the developmental milestones or accomplishments that may emerge at progressive levels of performance or proficiency along with example observable behaviors that describe the accomplishment. These are organized into a *developmental continuum* — a predictable but not rigid sequence of accomplishments. The developmental continuum is predictable in that it places accomplishments in the order in which they emerge in most children based on current research. The continuum is "not rigid" in that the accomplishments and the observable behaviors do not constitute a set of stages with a number of required indicators that a child must exhibit before moving to the next level. The continuum is not intended for use as an assessment checklist. The behaviors listed beside each accomplishment are "samples" of what a child might do and are not an exhaustive inventory. A child may skip a level, develop skills, or behave in ways that are identified in two different levels at the same time. The developmental continuum and the related observable behaviors described for each benchmark are meant as a *general guide* to help teachers identify those skills that are most likely to occur next in the continuum and to provide real examples that teachers can use to guide assessment and instruction.

As teachers implement these benchmarks in the classroom, it is important for them to keep in mind that literacy is a complex process involving multiple interactions between different aspects of supporting knowledge and specific accomplishments along the developmental continuum. Thus, teachers should focus on all of the benchmarks and ensure that children learn the supporting knowledge that they determine is necessary for each level of the developmental continuum. Preschool teachers should focus primarily on the beginning levels of the developmental continuum for each benchmark; kindergarten teachers should expect their children to function at various levels and to make different amounts of progress along the continuum.

II. Early Literacy Standards and Benchmarks

This section contains the early literacy standards and benchmarks that were identified as a result of the process described in Section 1. Additionally, the categories, supporting knowledge, developmental continuum, and example behaviors necessary for classroom implementation of these standards and benchmarks have also been included.

Summary of Standards and Benchmarks

standard 1

Demonstrates competence in the general skills and strategies of the reading process.

Benchmarks	Categories
1.1 Understands the basic concepts of written language.	Concepts of Print
1.2 Knows the basic conventions of reading (e.g., purpose, parts, elements, and procedures).	Conventions of Reading, Text Comprehension
1.3 Knows the names of the letters of the alphabet and can identify them in any context.	Visual Letter Recognition
1.4 Matches speech sounds with the letters or letter combinations that represent these sounds.	Sound-to-Symbol Correspondence, Phonological Awareness
1.5 Converts written word into spoken word.	Sight Word Recognition and Decoding

standard 2

Demonstrates competence in the general skills and strategies of the writing process.

Benchmarks	Categories
2.1 Knows that the purpose of writing is to communicate with oneself and others.	Purpose of Writing, Text Comprehension, Oral Language Development
2.2 Applies the alphabetic principle with increasing complexity and conventionality when writing.	Alphabetic Principle, Phonological Awareness, Sound-to-Symbol Correspondence, Orthographic Knowledge
2.3 Uses the basic conventions of writing (e.g., prints upper- and lowercase letters with proper directionality, spacing, punctuation, and capitalization).	Letter Formation, Conventions of Writing

READING

standard 1

Demonstrates competence in the general skills and strategies of the reading process.

early literacy benchmark 1.1

Understands the basic concepts of written language.

supporting knowledge

- Understands that a symbol is a representation of an object or event.
- Knows that there are conventional symbols as well as made-up symbols that only have personal meaning.
- Uses conventional symbols (letters and numbers).
- Understands that a written word has a specific meaning.
- Knows that words are composed of letters and that the order of the letters in a word is important.
- Knows that when you read, you read every letter in the word.
- Knows that a sentence is a unit of meaning that represents a complete thought.
- Knows that sentences are composed of words and that the order of words in a sentence affects its meaning.

category

- Concepts of Print

developmental continuum*

Level 1. Understands that alphabetic symbols differ from other systems.

Level 2. Understands that written language consists of discrete words.

Level 3. Understands the concept of a sentence.

example behaviors

- Is content to mix letters with other less conventional pictorial symbols.
- Recognizes that numbers and letters are conventional symbols.
- Recognizes that only letters have both a name and a matching sound.
- When asked to point to words in print, points to each word separately and does not sweep a finger across two or more words.
- When asked to point to letters in words in print, points to each letter separately and does not miss any letter.
- When asked to match two words, can match words consistently letter by letter in any context (including long words and different fonts).
- When listening to someone read, can distinguish between a short pause (at a comma) and a long pause or change of intonation indicating the end of a sentence. Never interrupts with questions or comments in the middle of a sentence, whether short or long.

READING

standard 1

Demonstrates competence in the general skills and strategies of the reading process.

early literacy benchmark 1.2

Knows the basic conventions of reading (e.g., purpose, parts, elements, and procedures).

supporting knowledge

- Uses strategies to monitor comprehension during oral interactions.
- Uses strategies to monitor comprehension while engaged in oral exchanges about written material.
- Knows that books, shopping lists, signs, menus, and other environmental text contain stories, reminders, directions, choices, and other information and are accessed through reading and created through writing.
- Understands that print carries a message.
- Understands that the same print always carries the same message.
- Understands that reading words differs from processing pictures.
- Knows where to start reading.
- Knows to read from left to right and from top to bottom.
- Understands that a sentence may continue at the beginning of the next line of a text.
- Knows where the text begins and ends.
- Understands that pictures and captions can provide meaning for what is being read.
- Uses background knowledge to assist comprehension but does not use it to replace information in the text.

category

- Conventions of Reading
- Text Comprehension

developmental continuum*

Level 1. Knows how to handle printed materials.

Level 2. Knows the purpose of books and other printed materials.

Level 3. Knows the functions of the basic elements of printed material.

example behaviors

- Knows how to hold a book to read it.
- Knows about the front and the back of a book.
- Points to the beginning of the story regardless of how the page looks.
- Knows how to turn pages in a book or magazine.
- Knows specific skills for handling and paying attention to menus, lists, signs, and labels.
- Knows that when someone opens a familiar book on a familiar page, one can expect to hear a specific part of a story. Does not know if it is print or pictures that carry the message.
- May expect all books to have pictures and assumes that reading involves looking at pictures.
- May expect a sign or label to have a specific color, shape, or font. Believes that the meaning is conveyed by the characteristic design features regardless of the letters on the sign or label.
- Can consistently differentiate between print and pictures and knows the salient features of print.
- Pays attention to all letters in a word and to all words in a sentence even when some distractors are present.



developmental continuum* cont'd**example behaviors** cont'd

Level 4. Knows about procedures involved in reading.

Level 5. Knows about the relationship between meaning and printed text.

- Knows that two pictures can describe the same object even if they look different or are missing some details (e.g., a house with or without a chimney is still a house), but that two words describe the same object only if the letters in both of them match (e.g., "horse" and "house" stand for two different objects).
- May expect that any desired information about the topic of a book can be derived from having read a book (e.g., may expect "The Three Little Pigs" to explain why the pigs' mother did not come to help them).
- Can listen to someone reading a book without pictures or with very schematic pictures. Always uses text as a source of meaning. May refer to the text to explain pictures instead of using pictures to explain text. Refers to the text when answering comprehension questions. When text and pictures do not match, chooses text over pictures and explains why.
- Can reliably identify different printed characters (letters, numbers, and commonly used symbols) in any font. Can explain the differences among fonts by referring to attributes of letters and aspects of design.
- Consistently points to the words following left-to-right directionality, regardless of the length of the words or the line.
- Consistently points to the lines of print following top-to-bottom directionality, regardless of the number of lines on a page or the page layout.
- Consistently points to the first word on a line when presented with any format of print.
- Consistently sweeps at the end of the line independent of the attributes of print. Never sweeps in the middle of the line.
- Indicates comprehension by recalling a sequence of elements from the text (e.g., arranges a set of pictures to match the sequence of events in the narrative).
- Uses text cues independent of their position in the text even with unfamiliar texts (e.g., given the written sentence "we ran after the bear came," recognizes that the bear came first in spite of the order mentioned in the text).
- Sees the text as the only source of the language used in reading aloud. May refer specifically to parts of the text for additional information (e.g., to answer "where in the book do they say...?").



READING

standard 1

Demonstrates competence in the general skills and strategies of the reading process.

early literacy benchmark 1.3

Knows the names of the letters of the alphabet and can identify them in any context.

supporting knowledge

- Understands that a symbol is a representation of an object or event.
- Knows that there are conventional symbols as well as made-up symbols that only have personal meaning.
- Uses conventional symbols (letters and numbers).
- Knows the names of the letters in the alphabet.
- Understands that a letter always has the same name, regardless of the context.
- Understands that if a letter is reversed or a critical feature is changed, it is no longer the same letter.
- Understands that the letters of the alphabet can be put in ABC order.

category

- Visual Letter Recognition

developmental continuum*

Level 1. Can recognize a few (5-10) letters, most of them uppercase.

Level 2. Can recognize the majority of the most frequently occurring uppercase and some of the most frequently occurring lowercase letters.

example behaviors

- Is more likely to recognize letters of his or her own name (first and then last) and letters that frequently occur in environmental print.
- Recognizes letters in a specific context (mostly in environmental print), but may not recognize them when the context changes.
- Does not notice if a written letter is oriented incorrectly (backwards or upside down) or is missing a small detail as long as other features of the environmental context do not change.
- Is more likely to confuse uppercase letters within each of the following groups: DCGOQ, BPRSJU, EF, and NMWAVYHLITKXZ — but may make distinctions between letters that belong to different groups.
- Knows parts of the ABC sequence by rote, but does not use it to associate a letter symbol with a letter name.
- Can recognize letters both in a familiar context (own name, environmental print) and in isolation.
- Can recognize letters across different contexts as long as they are written in a similar font. May have trouble recognizing "o" and "a" or "g" and "q" as exemplars of the same letter. May have difficulty recognizing handwritten letters, even his or her own.



developmental continuum*

cont'd

Level 3. Can recognize all of the most frequently occurring upper- and lowercase letters, but not all of the letters.

Level 4. Can recognize all upper- and lowercase letters.

example behaviors

cont'd

- Knows the ABC sequence for the beginning of the alphabet and can match letter symbols with letter names in alphabetic order, but may have trouble matching the letters that come later in the sequence (e.g., identifies KLMNOP as one letter).
- Is more likely to correctly recognize the letter if the letter name and the letter sound match. May incorrectly identify a letter if the letter name does not match the letter sound (such as "w" and "y") or if there is more than one letter that is associated with the same sound (such as "c" and "s" as in "city" and "see," or "c" and "k" as in "cat" and "kitten").
- Can discriminate between letters with distinct visual features, although is likely to confuse the following pairs of letters: MN, MW, IT, db, qg, and pq.
- Can recognize letters in a variety of contexts — familiar and unfamiliar — as well as in isolation. Can notice that one or more letters have changed even if the other visual features of a familiar word (e.g., color, logo) have not changed.
- Can recognize letters printed in all fonts he or she is exposed to, but may make mistakes recognizing letters in the handwriting of other people.
- Knows the ABC sequence and can use an alphabet chart independently to correctly match the letter symbol with the letter name.
- Knows that letter names and letter sounds may not match, but may occasionally respond with a letter sound when asked to name a letter (and vice versa).
- Can discriminate between letters that differ in their visual features, as well as between letters that have similar visual features, but may still confuse letters in the following pairs: "d" and "b," "q" and "g," and "p" and "q."
- Can recognize letters in any context and in isolation.
- Can name letters when they are presented in an unfamiliar sequence, for example not in alphabetic order.
- Can recognize letters in any common font or handwriting as long as they are printed and not cursive.
- Can accurately produce the letter name or letter sound for all letters.



READING

standard 1

Demonstrates competence in the general skills and strategies of the reading process.

early literacy benchmark 1.4

Matches speech sounds with the letters or letter combinations that represent these sounds.

supporting knowledge

- Produces speech sounds and combines them into words.
- Focuses on the form of language delivery and develops metalinguistic control including phonological awareness (e.g., notices that "bat" and "cat" rhyme and that "bat" and "tab" have the same elements in reverse order).
- Discriminates among speech sounds.
- Manipulates speech sounds presented separately or in the context of a word (e.g., separates sounds, blends sounds).
- Discriminates among letter symbols.
- Knows that speech sounds are represented with letter symbols.
- Understands the concept of one-to-one correspondence.

category

- Sound-to-Symbol Correspondence
- Phonological Awareness

developmental continuum*

Level 1. Can recognize a few speech sounds represented by single letter symbols.

Level 2. Can recognize most speech sounds represented by single letter symbols.

example behaviors

- Can match some single letter symbols with the consonant sounds they represent. Is more likely to match those that are at the beginning of the letter name (e.g., is more likely to correctly match "b" with /b/ than "w" with /w/).
- Can match some single letter symbols with the vowel sounds they represent. Is more likely to match those that represent letter names or those they encounter frequently (e.g., matches "u" with long /u/ as in "unicorn" and matches "a" with short /a/ sound as in "Ann").
- Can match most single letter symbols with the consonant sounds they represent. Is more likely to match those that match one to one (e.g., /b/ is made only by "b," and "b" only makes the /b/ sound).
- Can match most single letter symbols with the vowel sounds they represent. Is more likely to correctly choose the letter symbol when it represents a letter name (e.g., the long /a/ sound in "ace" is the same as the name of the letter "a"). Can correctly choose the letter symbol that represents both a long and a short vowel sound when these sounds do not differ significantly (e.g., the long /o/ sound as in "open" does not differ much from the short /o/ sound as in "onion"). May still have difficulty choosing other single letter symbols that represent long and short vowels that do differ significantly (e.g., can match letter "i" with the long /i/ sound as in "ice," but cannot match the letter "i" with the short /i/ sound as in "igloo").



developmental continuum*

Level 3. Can recognize all speech sounds represented by single letter symbols.

Level 4. Can recognize single sounds represented by more than one letter.

Level 5. Can recognize combinations of sounds, each of which is represented by a combination of letters.

example behaviors

- Can match all single letter symbols with the consonant sounds they represent including letter symbols that represent more than one consonant sound (e.g., can correctly match such letters as "c" and "g" with both of the sounds that each of these letters commonly represents, as in "cat" and "city," and "goose" and "giraffe").
- Can match all single letters symbols with the vowel sounds they represent. At this stage, usually chooses the letter symbol that is most commonly used to represent a certain vowel sound (e.g., short /u/ sound is more commonly represented by the letter "u" like in "up" than by the letter "o" like in "son").
- Can recognize consonant sounds that have two-letter symbols (digraphs), such as "th," "ch," and "sh" as in "that," "thumb," "chair," and "ship."
- Can recognize vowel sounds that have two-letter symbols, such as "oo," "ee," and "oy" as in "book," "boot," "beet," and "boy."
- Can recognize combinations of two consonant sounds (blends) that have combinations of two-letter symbols (e.g., "bl," "cr," "pl," and "dr" as in "black," "critter," "plane," and "drum").



READING

standard 1

Demonstrates competence in the general skills and strategies of the reading process.

early literacy benchmark 1.5

Converts written word into spoken word.

supporting knowledge

- Understands that the written word can be spoken and the spoken word can be written.
- Uses phonological awareness to develop the alphabetic principle.
- Knows that sometimes he or she may not know the meaning of a word.
- Applies syntactic, semantic, and pragmatic knowledge from oral language experiences to reading and writing.
- Develops literacy-specific syntactic, semantic, and pragmatic knowledge.
- Applies the alphabetic principle to decode or recognize unknown words.
- Uses visual features for instant recognition of words.
- Uses strategies to identify or clarify unknown words (e.g., context clues, picture clues).
- Uses surrounding letters for letter recognition.

category

- Sight Word Recognition and Decoding

developmental continuum*

Level 1. Understands that written words have a specific meaning.

Level 2. Consistently recognizes a frequently seen word in a familiar context.

example behaviors

- When asked about a word, provides a response from the appropriate semantic field but may not be constrained by the specific word. May "read" the same word differently every time but retains the same "meaning" (e.g., "Pepsi" can be read as "soda" and as "pop").
- Knows that certain words stand for certain objects, but expects them to describe these objects the same way pictures do.
- May expect two words that signify similar objects to look alike (e.g., "dog" and "puppy").
- May confuse properties of the words with the properties of the objects they denote (e.g., may think long words stand for large objects).
- May use picture cues and environmental contexts to confirm the meaning of a word.
- Can repeatedly recognize a word only if the contexts are identical or similar (e.g., always recognizes the word "STOP" as long as it is written on a red, octagonal-shaped stop sign).
- Inconsistently uses a very small number of relevant visual features and continues to use some irrelevant ones (e.g., may recognize "I" because it is always capitalized; at the same time, can recognize "LOOK" only when the two "O"s are depicted as eyes).
- When asked to read a word in a familiar context, may substitute another word based on its meaning and its length.
- Begins to understand that if words sound alike, they should look alike.



developmental continuum***example behaviors**

Level 3. Consistently recognizes a short word across different contexts.

- Can read one- and two-letter words and can recognize some three-letter words if they occur frequently (e.g., "the," "mom," "dad"). Cannot read longer words even if he or she knows the letters and some parts of these words.
- Can decode the first and sometimes the last letter of a word.
- When asked to read a new word, starts reading from the left but may skip the middle of the word or its ending.
- When asked to read a new word, may substitute another word based on some of the visual cues (e.g., reads "It" for "I" when "It" begins a sentence or reads "little" for "letter" on the basis of the double "t" in the middle) or may substitute words based on meaning similarity.
- Uses a very small number of relevant visual features but mostly for sight recognition of high-frequency words. Cannot always apply these features to new words (e.g., can read "and", but may have trouble recognizing "sand").
- Misses some visual features of letters that are critical (e.g., orientation in "b" and "d" or number of straight lines in "n" and "m").

Level 4. Applies the alphabetic principle to recognition of unfamiliar words.

- When asked to read a word, sounds out the letters of the word and then may or may not blend the individual sounds or sound combinations.
- When asked to read a word, usually pays attention to the first and the last letter-sound relationships, but may ignore the letters or sounds in the middle of the word. Knows that words that rhyme have similar endings. May consider two words to be the same if they only differ in the order of the letters in the middle.
- May occasionally alternate between sounding out the letters of the word and saying the letter names.
- When asked to read a word, usually scans the word from left to right, or may occasionally reverse directions if the word makes sense both ways (e.g., "saw" and "was"). May still skip some letters.
- Recognizes some high-frequency, long words.
- May sight-read many four- and five-letter words and may sight-read some longer words if they occur frequently (e.g., "Nintendo"). Is more likely to make mistakes with longer words than with four- and five-letter words.



developmental continuum* cont'd

Level 5. Applies decoding strategies and knowledge of some sight words to reading of unfamiliar words.

example behaviors cont'd

- If asked to read a word repeatedly, always reads this word the same way and knows that for two words to be read the same way they usually have to be written identically. While reading aloud, self-corrects with no prompting if he or she reads letter combinations in the wrong order.
- Always starts reading from left to right and sequentially scans individual letters and larger word chunks following left-to-right directionality.
- Can break words into chunks that are ready to be blended and can extract chunks of several letters (e.g., "ing," "ed," or "est"). Decoding of single letters as well as chunks depends on the surrounding letters (e.g., silent "e" at the end of a word or the sounds made by the letters "c" or "g" depending on the vowel that follows).
- Can sight-read long words only if they occur frequently. When encountering a long word that seems unfamiliar, tries to decode, breaking the word into meaningful chunks (e.g., prefix, suffix). Can recognize chunks of familiar words when they are present in a new word.



WRITING

standard 2

Demonstrates competence in the general skills and strategies of the writing process.

early literacy benchmark 2.1

Knows that the purpose of writing is to communicate with oneself and others.

supporting knowledge

- Controls syntactic, semantic, and pragmatic aspects of language.
- Uses strategies to monitor comprehension while listening.
- Uses strategies to monitor comprehension while engaged in oral exchanges about written material.
- Knows that books, shopping lists, signs, menus, and other environmental text contain stories, reminders, directions, choices, and other information and are accessed through reading and created through writing.
- Understands that print carries a message.
- Understands that the same print always carries the same message.
- Produces speech sounds and combines them into words.
- Focuses on the form of language delivery and develops metalinguistic control including phonemic awareness (e.g., notices that "bat" and "cat" rhyme and that "bat" and "tab" have the same elements but in reverse order).
- Understands that writing is a way of communicating personal thoughts, feelings, and experiences.
- Understands that writing is a form of communication that can be read and re-read by the writer and by other people.
- Understands that the words used to deliver a message make a difference in how that message is communicated.

category

- Purpose of Writing
- Text Comprehension

developmental continuum*

Level 1. Assumes that making any marks is writing.

Level 2. Understands that an oral message can be represented with written language.

Level 3. Understands that once an oral message is represented with written words it should be read the same way every time.

example behaviors

- Draws, scribbles, or makes any marks and calls this process "writing."
- May pretend to read his or her own message.
- Converts own writing into oral words — "re-reads" — inconsistently.
- May attempt to formulate, in a general way, what the message will be before writing (e.g., "I will write a story about my teddy bear").
- May write a message that differs from the intended message.
- "Re-reads" own message using words that may differ from the intended message.
- "Re-reads" own message based on memory of the writing event rather than interpretation of specific written marks.
- Usually creates a written message that closely approximates the oral message it represents.
- Can "re-read" own message several days after the writing takes place.
- Generally expects others to be able to read the message the same way he or she reads it.

WRITING

standard 2

Demonstrates competence in the general skills and strategies of the writing process.

early literacy benchmark 2.2

Applies the alphabetic principle with increasing complexity and conventionality when writing.

supporting knowledge

- Understands that a symbol is a representation of an object or event.
- Knows that there are conventional symbols as well as made-up symbols that only have personal meaning.
- Uses conventional symbols (letters and numbers).
- Discriminates between letter symbols.
- Knows that written words are composed of letters.
- Understands that if a letter is reversed or a critical feature is changed, it is no longer the same letter.
- Discriminates between speech sounds.
- Knows that spoken words are composed of sounds.
- Knows that speech sounds are represented with letter symbols.
- Understands the concept of one-to-one correspondence.
- Knows that the sound and letter composition of a word affects its meaning.
- Knows that the order of letters and sounds affects the meaning of the word.
- Knows that when you read, you read every letter in the word.
- Knows letter-to-sound correspondences.
- Knows that the order of the letters in a written word matches the order of the sounds in a spoken word.
- Knows that there is a correct way to spell a word.

category

Alphabetic Principle
Phonological Awareness
Sound-to-Symbol Correspondence
Orthographic Knowledge

developmental continuum*

Level 1. Knows that different sounds in a word are represented by different symbols. Knows that more sounds in a word require more written symbols.

Level 2. Identifies the most salient sound in a spoken word and attempts to represent it in writing.

example behaviors

- Uses words represented by a letter string that consists of different letters and letter-like symbols.
- Uses longer words or messages represented by longer letter strings.
- Usually represents the beginning sound.
- Often represents isolated vowels (e.g., "I" or "a").
- When writing, may represent sound(s) by using a letter name instead of the sound(s)'s correct orthographical equivalent (e.g., uses "c" to represent "see," "u" to represent "you," "r" to represent "are").
- Uses inconsistent written representations of the same sound.
- Represents a sound as he or she says the sound regardless of how accurate that articulation is (e.g., represents /dr/ as in "drum" by the letter "g" and not by the blend "dr").
- Represents each word by one to three letters, mostly in the correct order in relation to the sounds they represent.

developmental continuum* cont'd

Level 3. Identifies two or three sounds in a spoken word (usually beginning and ending) and attempts to represent them in writing in the corresponding order.

Level 4. Identifies all component sounds in a spoken word and attempts to represent them in writing in the corresponding order, but estimates spelling based on sound identification.

Level 5. Combines known conventional spelling rules with own estimation based on sound identification.

Level 6. Uses conventional spelling when writing most words.

example behaviors cont'd

- Represents most of the single consonant sounds and some vowel sounds. Vowel sounds are more likely to be represented when in medial position (e.g., as in "cat," "sun") or at the beginning of the word (e.g., as in "is," "it").
- Represents the first and last sounds by letters in the proper order.
- May represent medial sounds but may place them out of order, after the symbol representing the final sound.
- Represents some blends.
- Represents some more complex sound combinations (e.g., "ing").
- Represents each word by a sequence of letters in the order that follows the sequence of sounds, including blends (e.g., "lfnt" for "elephant").
- May use alternate spellings for the same sound in different writing samples (e.g., "cat" and "kat").
- May use letter names to represent a sound in an unfamiliar word (e.g., "lf" for "elf") even though he or she relies on the letter-sound relationship when using the same letter in a familiar word (e.g., "love").
- Primarily spells using own estimations.
- May use the known conventional spelling of high-frequency words to develop spelling for unknown words (e.g., spells "buy" as "by" by analogy with "my").
- May add known digraphs (e.g., "th" or "ch") or double vowel combinations (e.g., "ee" or "oo") to known correspondences between sounds and single letters.
- May overgeneralize a spelling rule for a time (e.g., adds a silent "e" at the end of all words).
- May conventionally spell some words (e.g., "the") and may consistently use the same estimated spelling for all other words (e.g., "mi" for "my," "dis" for "this").
- May use the conventional spelling of known words to spell new words, even though this results in an unconventional spelling (e.g., "aret" for "art," "mee" for "me").
- In the case of an unknown word, applies the closest rule (e.g., applies "silent e" when writing "rane" for "rain").

WRITING

standard 2

Demonstrates competence in the general skills and strategies of the writing process.

early literacy benchmark 2.3

Uses the basic conventions of writing (e.g., prints upper- and lowercase letters with proper directionality, spacing, punctuation, and capitalization).

supporting knowledge

- Knows that a symbol is a representation of an object or event.
- Knows that there are conventional symbols as well as made-up symbols that only have personal meaning.
- Uses conventional symbols.
- Knows the shapes of all letters of the alphabet in upper- and lowercase.
- Understands that if a letter is reversed or a critical feature is changed, it is no longer the same letter.
- Knows that written words are composed of letters and that the order of the letters in the word is important.
- Uses left-to-right directionality.
- Uses hand positioning and pencil grip as a means of controlling writing instrument.
- Forms each of the letters in the alphabet in upper- and lowercase.
- Uses spaces to separate words while writing.
- Knows that a sentence should end with a punctuation mark.
- Knows that uppercase should be used at the beginning of a sentence for the pronoun "I" and for proper names.

category

- Letter Formation
- Conventions of Writing

developmental continuum*

- Level 1. Attempts to act out the process of writing.
- Level 2. Attempts to represent oral language in writing.
- Level 3. Uses proper letter formation in writing.

example behaviors

- Draws using random lines.
- Draws using continuous lines (e.g., spirals and circles).
- Scribbles.
- Produces drawings that represent a spoken message.
- Produces letter-like forms mixed with drawings to represent spoken language. May include actual letters.
- Produces letters that are generally consistent in shape with some variations and some incorrect elements (e.g., "n" for "h" or "C" for "G").
- Produces letters that are inconsistent in orientation (e.g., "M" for "W" or "b" for "d").
- Consistently produces correctly formed letters.
- Generally writes in uppercase letters, but occasionally uses lowercase letters.

developmental continuum* cont'd

Level 4. Experiments with conventions of writing when writing words.

Level 5. Uses some conventions of writing.

Level 6. Knows about directionality, spacing, and some uses for punctuation and capitalization.

example behaviors cont'd

- Produces letters combined in words and word-like sequences. Follows mostly left-to-right directionality and randomly uses spaces.
- May use punctuation marks or other marks to indicate spaces.
- Writes words using a mixture of upper- and lowercase letters.
- Writes following left-to-right directionality.
- Uses spaces to separate words in a sentence and to separate two sentences.
- Uses capitalization and punctuation inconsistently.
- Uses uppercase letters in the beginning of sentences for the pronoun "I" and for some proper names.
- Uses a punctuation mark to end a sentence, but isn't aware of the meaning of different punctuation marks.

Appendix A

Research and Theory Reviewed on Early Childhood Development

- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Barron, R. W. (1987). Word recognition in early reading: A review of the direct and indirect access hypotheses. In P. Bertelson (Ed.), *The onset of literacy: Cognitive processes in reading acquisition* (pp. 93-119). Cambridge, MA: MIT Press.
- Besner, D., Coltheart, M., & Davelaar, E. (1984). Basic processes in reading: Computation of abstract letter identities. *Canadian Journal of Psychology*, 38(1), 126-134.
- Bialystok, E. (1995). Making concepts of print symbolic: Understanding how writing represents language. *First Language*, 15, 317-338.
- Bialystok, E. (1997). Effects of bilingualism and biliteracy on children's emerging concepts of print. *Developmental Psychology*, 33(3), 429-440.
- Bowman, B., Donovan, M. S., & Burns, M. S. (2000). *Eager to learn: Educating our preschoolers*. Washington, DC: National Academy Press.
- Bredenkamp, S., & Rosegrant, T. (1992). *Reaching potentials: Appropriate curriculum and assessment for young children*. Washington, DC: National Association for the Education of Young Children.
- Bruck, M., & Treiman, R. (1990). Phonological awareness and spelling in normal children and dyslexics: The case of initial consonant clusters. *Journal of Experimental Child Psychology*, 50(1), 156-178.
- Byrne, B. (1991). Experimental analysis of the child's discovery of the alphabetic principle. In L. Rieben & C. A. Perfetti (Eds.), *Learning to read: Basic research and its implications*. Hillsdale, NJ: Erlbaum.
- Byrne, B., & Fielding-Barnsley, R. (1989). Phonemic awareness and letter knowledge in the child's acquisition of the alphabetic principle. *Journal of Educational Psychology*, 81(3), 313-321.
- Byrne, B., & Fielding-Barnsley, R. (1990). Acquiring the alphabetic principle: A case for teaching recognition of phoneme identity. *Journal of Educational Psychology*, 82(4), 805-812.
- Center for the Improvement of Early Reading Achievement (CIERA). (1998). *Improving the reading achievement of America's children: 10 research-based principles*. Ann Arbor, MI: University of Michigan, CIERA.
- Coltheart, M., Curtis, B., Atkins, P., & Haller, M. (1993). Models of reading aloud: Dual-route and parallel-distributed-processing approaches. *Psychological Review*, 100(4), 589-608.

- Coltheart, M., & Rastle, K. (1994). Serial processing in reading aloud: Evidence for dual-route models of reading. [Special Section: Modeling visual word recognition] *Journal of Experimental Psychology: Human Perception & Performance*, 20(6), 1197-1211.
- Coltheart, V., Patterson, K., & Leahy, J. (1994). When a ROWS is a ROSE: Phonological effects in written word comprehension. *Quarterly Journal of Experimental Psychology*, 47, 917-955.
- Ehri, L. C. (1986). Sources of difficulty in learning to spell and read. *Advances in Developmental & Behavioral Pediatrics*, 7, 121-195.
- Ehri, L. C. (1989). The development of spelling knowledge and its role in reading acquisition and reading disability. *Journal of Learning Disabilities*, 22(6), 356-365.
- Ehri, L. C. (1993). How English orthography influences phonological knowledge as children learn to read and spell. In J. S. Robert (Ed.), *Literacy and language analysis* (pp. 21-43). Hillsdale, NJ: Erlbaum.
- Ehri, L. C. (1995). Phases of development in learning to read words by sight. [Special Issue: The contribution of psychological research] *Journal of Research in Reading*, 18(2), 116-125.
- Ehri, L. C. (1995). Teachers need to know how word reading processes develop to teach reading effectively to beginners. In C. N. Hedley, P. Antonacci, & M. Rabinowitz (Eds.), *Thinking and literacy: The mind at work*. Hillsdale, NJ: Erlbaum.
- Ehri, L. C., & Robbins, C. (1992). Beginners need some decoding skill to read words by analogy. *Reading Research Quarterly*, 27(1), 12-26.
- Ehri, L. C., & Wilce, L. S. (1982). Recognition of spellings printed in lower and mixed case: Evidence for orthographic images. *Journal of Reading Behavior*, 14(3), 219-230.
- Ehri, L. C., & Wilce, L. S. (1987). Cipher versus cue reading: An experiment in decoding acquisition. *Journal of Educational Psychology*, 79(1), 3-13.
- Ehri, L. C., & Wilce, L. S. (1987). Does learning to spell help beginners learn to read words? *Reading Research Quarterly*, 22(1), 47-65.
- Ehri, L. C., Wilce, L. S., & Taylor, B. B. (1987). Children's categorization of short vowels in words and the influence of spellings. [Special Issue: Children's reading and the development of phonological awareness] *Merrill-Palmer Quarterly*, 33(3), 393-421.
- Ehri, L. C., Wilce, L. S., & Taylor, B. B. (1988). Children's categorization of short vowels in words and the influence of spellings. In E. S. Keith (Ed.), *Children's reading and the development of phonological awareness*. Detroit, MI: Wayne State University Press.
- Forman, B. R. (1994). Phonological and orthographic processing: Separate but equal? In B. V. Wise (Ed.), *The varieties of orthographic knowledge, 1: Theoretical and developmental issues. Neuropsychology and cognition, Vol. 8*. Netherlands: Kluwer Academic.

- Foorman, B. R., & Liberman, D. (1989). Visual and phonological processing of words: A comparison of good and poor readers. *Journal of Learning Disabilities*, 22(6), 349-355.
- Freebody, P., & Byrne, B. (1988). Word-reading strategies in elementary school children: Relations to comprehension, reading time, and phonemic awareness. *Reading Research Quarterly*, 23(4), 441-453.
- Gibb, C., & Randall, P. E. (1988). Metalinguistic abilities and learning to read. *Educational Research*, 30(2), 135-141.
- Gibson, E. J., & Levin, H. (1975). *The psychology of reading*. Cambridge, MA: MIT Press.
- Graham, S., Harris, K. R., & Loynachan, C. (1996). The direct spelling thinking activity: application with high-frequency words. *Learning Disabilities Research and Practice*, 11(1), 34-40.
- Greenberg, S. N., Koriat, A., & Shapiro, A. (1992). The effects of syntactic structure on letter detection in adjacent function words. *Memory & Cognition*, 20(6), 663-670.
- Head Start Act, as amended, 42 U.S.C.A. § 9801 et seq. (1998).
- Hohn, W. E., & Ehri, L. C. (1983). Do alphabet letters help prereaders acquire phonemic segmentation skill? *Journal of Educational Psychology*, 75(5), 752-762.
- International Reading Association and the National Association for the Education of Young Children (1998). Learning to read and write: Developmentally appropriate practices for young children. *Young Children*, 53(4), 30-46.
- Johnson, N. F., & Pugh, K. R. (1994). A cohort model of visual word recognition. *Cognitive Psychology*, 26, 240-346.
- Johnston, R. S., Anderson, M., & Holligan, C. (1996). Knowledge of the alphabet and explicit awareness of phonemes in pre-readers: The nature of the relationship. *Reading and Writing*, 8(3), 217-234.
- Kendall, J. S., & Marzano, R. J. (1997). *Content knowledge: A compendium of standards and benchmarks for K-12 education*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Kleeck, A. V. (1990). Emergent literacy: Learning about print before learning to read. *Topics in Language Disorders*, 10, 25-45.
- Koriat, A., & Greenberg, S. N. (1993). Prominence of leading functors in function morpheme sequences as evidenced by letter detection. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 19(1), 34-50.
- Lomax, R., & McGee, L. (1987). Young children's concepts about print and reading: Toward a model of word reading acquisition. *Reading Research Quarterly*, 22, 237-256.
- Marzano, R. J. (1998). *A theory-based meta-analysis of research on instruction*. Aurora, CO: Mid-continent Regional Educational Laboratory.

- Marzano, R. J., & Kendall, J. S. (1996). *A comprehensive guide to designing standards-based districts, schools, and classrooms*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Marzano, R. J., & Kendall, J. S. (1998). *Implementing standards-based education*. Washington, DC: National Education Association.
- Masonheimer, P. E., Drum, P. A., & Ehri, L. C. (1984). Does environmental print identification lead children into word reading? *Journal of Reading Behavior*, 16(4), 257-271.
- Metsala, J. L., & Ehri, L. C. (1998). *Word recognition in beginning literacy*. Mahwah, NJ: Erlbaum.
- Morrow, L. M. (1997). *Literacy development in the early years: Helping children read and write* (3rd ed.). Needham Heights, MA: Allyn & Bacon.
- Murray, B. A. (1998). Gaining alphabetic insight: Is phoneme manipulation skill or identity knowledge causal? *Journal of Educational Psychology*, 90(3), 461-475.
- National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Bethesda, MD: National Reading Panel.
- Otto, B., & Sulzby, E. (1989). *Emergent writing and rereading by young children identified as "academically able."* Chicago: Northeastern Illinois University.
- Read, C. (1971). Pre-school children's knowledge of English phonology. *Harvard Educational Review*, 41(1), 1-34.
- Rieben, L., & Saada-Robert, M. (1991). Developmental patterns and individual differences in the word-search strategies of beginning readers. *Learning & Instruction*, 1(1), 67-87.
- Scanlon, D. M., & Veluntino, F. R. (1996). Prerequisite skills, early instruction, and success in first-grade reading: Selected results from a longitudinal study. *Mental Retardation and Developmental Research Review*, 2, 54-63.
- Scott, J. A., & Ehri, L. C. (1990). Sight word reading in prereaders: Use of logographic vs. alphabetic access routes. *Journal of Reading Behavior*, 22(2), 149-166.
- Shepard, L. A. (2000). The role of assessment in a learning culture. *Educational Researcher*, 29(7), 4-14.
- Snow, C. E., Burns, S. M., & Griffin, P. (1998). *Preventing reading difficulties in young children*. Washington DC: National Academy Press.
- Stage, S. A., & Wagner, R. K. (1992). Development of young children's phonological and orthographic knowledge as revealed by their spellings. *Developmental Psychology*, 28(2), 287-296.
- Stemberger, J. P., & Treiman, R. (1986). The internal structure of word-initial consonant clusters. *Journal of Memory & Language*, 25(2), 163-180.

- Sterling, C., & Seed, J. (1992). Phonological spelling in young children and some origins of phonetically plausible and implausible errors. In C. M. Sterling & C. Robson (Eds.), *Psychology, spelling and education: Multilingual matters*. Clevedon, England: Multilingual Matters, Ltd.
- Teale, W., & Sulzby, E. (1986). *Emergent literacy: Writing and reading*. Norwood, NJ: Ablex.
- Tolchinsky, L., & Teberosky, A. (1998). The development of word segmentation and writing in two scripts. *Cognitive Development*, 13, 1-24.
- Treiman, R. (1984). On the status of final consonant clusters in English syllables. *Journal of Verbal Learning & Verbal Behavior*, 23(3), 343-356.
- Treiman, R. (1985). Phonemic analysis, spelling, and reading. *New Directions for Child Development*, 27, 5-18.
- Treiman, R. (1985). Phonemic awareness and spelling: Children's judgments do not always agree with adults'. *Journal of Experimental Child Psychology*, 39(1), 182-201.
- Treiman, R. (1991). Children's spelling errors on syllable-initial consonant clusters. *Journal of Educational Psychology*, 83(3), 346-360.
- Treiman, R. (1994). To what extent do orthographic units in print mirror phonological units in speech? *Journal of Psycholinguistic Research*, 23(1), 91-110.
- Treiman, R., Berch, D., & Weatherston, S. (1993). Children's use of phoneme-grapheme correspondences in spelling: Roles of position and stress. *Journal of Educational Psychology*, 85(3), 466-477.
- Treiman, R., & Tincoff, R. (1997). The fragility of alphabetic principle: Children's knowledge of letter names can cause them to spell syllabically rather than alphabetically. *Journal of Experimental Child Psychology*, 64, 425-451.
- Treiman, R., Weatherston, S., & Berch, D. (1994). The role of letter names in children's learning of phoneme-grapheme relations. *Applied Psycholinguistics*, 15(1), 97-122.
- Tunmer, W. E., Herriman, M. L., & Nesdale, A. R. (1988). Metalinguistic abilities and beginning reading. *Reading Research Quarterly*, 23, 134-158.
- Venezky, R. L. (1967). English orthography: Its graphical structure and its relation to sound. *Reading Research Quarterly*, 2, 75-106.
- Venezky, R. L. (1995). How English is read: Grapheme-phoneme regularity and orthographic structure in word recognition. In I. Taylor & D. R. Olson (Eds.), *Scripts and literacy: Reading and learning to read alphabets, syllabaries and characters. Neuropsychology and cognition*, Vol. 7 (pp. 111-129): Netherlands: Kluwer Academic.
- West, J., Denton, K., & Germino-Hausken, E. (2000). *America's kindergartners*. Washington, DC: National Center for Educational Statistics.

Appendix B

National and State Standards Documents Reviewed

- American Association of School Librarians & Association for Educational Communications and Technology. (1998). *Information power: Building partnerships for learning*. Chicago: American Library Association.
- Arizona Department of Education. (1999). *Language arts standards*. Phoenix, AZ: Author.
- Arkansas Department of Education. (1998). *Sample grade level benchmarks: Grades K-4*. Little Rock, AK: Author.
- Australian Education Council. (1994). *English: A curriculum profile for Australian schools*. Commonwealth of Australia: Curriculum Corporation.
- Board of Education, Commonwealth of Virginia. (1995, June). *Standards of learning for Virginia Public Schools*. Richmond, VA: Author.
- California Department of Education. (1998). *English language arts content standards in California Public Schools: Kindergarten through grade twelve*. Sacramento, CA: Author.
- Colorado Department of Education. (2000). *Building blocks to Colorado's content standards: Reading and writing* (draft). Denver, CO: Author.
- Dichtelmiller, M. L. & Kaden, M. (1999). *A comparison of the Head Start performance standards and the work sampling system*. Ann Arbor, MI: Rebus.
- Florida Department of Education. (1996). *Florida curriculum framework: Language arts*. Tallahassee, FL: Author.
- Good, R. H. (1999). *Dynamic indicators of basic early literacy skills (DIBELS)*. Eugene, OR: University of Oregon.
- International Reading Association and the National Association for the Education of Young Children. (1998). Learning to read and write: Developmentally appropriate practices for young children. *Young Children*, 53(4), 30-46.
- Kendall, J. S., & Marzano, R. J. (1996). *Content knowledge: A compendium of standards and benchmarks for K-12 education*. Aurora, CO: Mid-Continent Regional Educational Laboratory.
- Massachusetts Department of Education. (1997, February). *The English language arts curriculum framework*. Malden, MA: Author.
- Mississippi State Department of Education. (1994). *Mississippi curriculum structure: English language arts*. Jackson, MS: Author.

- National Council of Teachers of English and the International Reading Association. (1995, October). *Standards for the English language arts* (draft). Urbana, IL: National Council of Teachers of English.
- Nebraska Department of Education. (1994). *The primary program: Growing and learning in the heartland*. Lincoln, NE: Author.
- New Standards. (1997). *Performance standards: English language arts, mathematics, science, applied learning, volume 1, elementary school*. Washington, DC: National Center on Education and the Economy.
- New Standards Project. (1999). *Primary literacy standards for kindergarten through third grade*. Washington, DC: National Center on Education and the Economy.

Appendix C

Definitions of Terms

Alphabetic Principle

The alphabetic principle is the idea that a sequence of letters in a printed word matches a sequence of sounds in a spoken word. A child who has developed an understanding of the alphabetic principle expects longer words to be represented with more letters and expects words that start with the same sound to have the same letter in the beginning.

Benchmark

A benchmark is a subcomponent of a standard. It is a statement that reflects expected understanding or skill at a specific developmental level. In other words, a benchmark translates the standard into what the student should understand or be able to do at a specific developmental level.

Conventional Symbols

Conventional symbols are symbols whose meaning is universally agreed upon. For example, letters, numbers, and some icons (e.g., arrows) are conventional symbols.

Developmental Continuum

The developmental continuum is a predictable but not rigid sequence of accomplishments that describes the progressive levels of performance or proficiency that are expected to emerge for a specific benchmark.

Example Behaviors

Example behaviors are behaviors children might engage in as they demonstrate accomplishments related to specific benchmarks. These examples help teachers apply the developmental continuum and benchmarks. They are not a definitive list of how a child might demonstrate a specific developmental accomplishment.

Metalinguistic Control

Metalinguistic control is the ability to control one's use of language based on knowledge of how the language operates. For example, a child can self-correct or correct another person when a sentence is not grammatically correct or when a particular word is used inappropriately.

Orthographic Knowledge

Orthographic knowledge is the knowledge of specific relationships between speech sounds and letters/letter combinations that are determined by the rules of spelling.

Phonological Awareness

Phonological awareness is the ability to reflect on the sound structure of spoken language. For example, a child who has developed phonological awareness notices when two words rhyme or when they start with the same sound.

Pragmatic Knowledge

Pragmatic knowledge is knowledge of how to communicate with others in an effective and appropriate way. For example, a child who has pragmatic knowledge can modify the way he or she talks depending on the audience (e.g., adults vs. other children, familiar people vs. strangers).

Semantic Knowledge

Semantic knowledge is knowledge of the meanings of words and word combinations. For example, a child who has semantic knowledge has a large vocabulary that he or she can use to adequately describe his or her life experiences. In addition, the child is expanding his or her existing vocabulary to gradually incorporate more abstract words.

Standard

A standard is a general statement that represents the information, skills, or both, that students should understand or be able to do. Standards typically identify the knowledge students should master by the end of their K-12 school experience.

Supporting Knowledge

Supporting knowledge is the underlying knowledge and skills that students need to acquire for a specific benchmark.

Syntactic Knowledge

Syntactic knowledge is knowledge of the rules by which words are arranged into sentences. For example, a child who has syntactic knowledge is able to understand and speak in grammatically correct sentences using all parts of speech appropriately.